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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,243	09/25/2006	Christian Walsdorff	296729US0PCT	2192

22850 7590 09/03/2009  
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER
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NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
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1793

NOTIFICATION DATE	DELIVERY MODE
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09/03/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/594,243	<b>Applicant(s)</b> WALSDORFF ET AL.	
	<b>Examiner</b> Ngoc-Yen M. Nguyen	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-18 is/are pending in the application.
- 4a) Of the above claim(s) 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Applicant's election with traverse of Group I in the reply filed on May 6, 2009 is acknowledged. The traversal is on the ground(s) that the Office did not consider the contribution of each invention, as a whole, in alleging the lack of a special technical feature. This is not found persuasive because whether Group II is interpreted in light of the description, the description is not automatically incorporated into the claim, and for the apparatus, there is no requirement that the temperature must be decreased or increased along the flow direction to the surface of the fluidized bed.

The requirement is still deemed proper and is therefore made FINAL.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clarke (4,137,706).

Clarke '706 discloses an engine comprising a first reaction chamber and a second reaction chamber (note claim 1). As shown in Figure 1, reformed fuel from the nozzles 11 mixes with heated air and the resulting mixture is then passed through the fluidized bed 19 of the fluidized bed heat exchanger 5 and a first exothermic reaction of the reformed fuel with air occurs. Then the products of the first exothermic reaction are

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passed through the fluidized bed 18 of the fluidized bed exchanger 4 where a second exothermic reaction occurs. The exothermic reaction occurring in the fluidized bed heat exchanger 5 is hotter than that in the fluidized bed heat exchanger 4 and so there is increasing temperature in both air and reformed fuel streams in the direction of arrow X, which is in opposite direction of the flow direction.

The fluidized beds 4 and 5 are considered as two stages of the apparatus in Clarke '706.

The difference is Clarke '706 does not specifically disclose the temperature difference between the two fluidized beds 4 and 5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that there the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 205 USPQ 215.

Claims 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hibi et al (2002/0172640) in view of Iaccino et al (2008/0047872) and Shirk (3,482,946).

Hibi '640 discloses a process of producing chlorine by oxidizing hydrogen chloride with oxygen using a supported ruthenium oxide catalyst (note claim 1). The support can be titanium oxide, alumina, zirconium oxide, etc. (note claim 4). This process is well known in the art as a Deacon process and the reaction is well known to be an exothermic reaction.

Hibi '640 further teaches that the catalyst can be used in a reactor such as fixed bed reactor, fluidized bed reactor, etc. with the fluidized bed has an advantage that the temperature distribution width in the reactor can be reduced because heat in the reactor can be sufficiently removed (note paragraph [0067]-[0068]).

The difference is Hibi '640 does not disclose that the temperature within the fluidized bed decreases from an absolute temperature maximum along the flow direction to the surface of the fluidized bed.

Iaccino '872 teaches that for an exothermic reaction, it may be carried in multiple catalyst beds with heat removal between beds. In addition, the lead bed(s) may be operated at higher temperatures to maximize kinetic rates and the tail bed(s) may be operated at lower temperatures to maximize thermodynamic conversion (note paragraph [0098]).

It would have been obvious to one of ordinary skill in the art to optimize the temperature difference between the lead bed and the tail bed to maximize both the kinetic rate and the thermodynamic conversion for the process of Hibi '640.

Shirk '946 is applied to teach a reactor for effecting contact between vaporous reactants and fluidized (note claim 1) finely divided solids in which an upright, elongate reaction zone is compartmented. Means are provided to introduce gasiform fluids into the lower end of the reactor and to remove gasiform fluid, free of solids, from the upper end of the reactor. Temperature control means is provided within each compartment to that the mixture of vapors and fluidized solids moving freely within and between compartments may have independent temperature adjustment within each compartment

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(note abstract). Shirk '946 further teaches that the reactor design provides an excellent means of maintaining the desired operating temperature within about 3 °F, assuring the removal of the exothermic heat of reaction (note column 4, lines 47-51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry the exothermic reaction of producing chlorine as disclosed in Hibi '640 with higher temperature at the beginning of the reaction (i.e. lead bed) and lower temperature at the end (tail bed), as suggested by Iaccino '872 in order to maximize both the kinetic rate and the thermodynamic conversion and to use a single fluidized bed reactor as suggested by Shirk '946 because this reactor is compartmented and each compartment can serve as a "bed" as suggested in Iaccino '872 and the temperature in each compartment can be controlled independently to obtain the higher and lower temperatures as desired by Iaccino '872.

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hibi '640 in view of Degnan et al (5,573,657) and Shirk '946.

Hibi '640 is applied as stated above.

Degnan '657 is applied to teach that for an exothermic process, it is thermodynamically favored by lower temperatures but for kinetic reasons, moderately elevated temperatures (i.e. higher temperatures) are normally used (note column 1, lines 32-35).

Thus, it would have been obvious to one of ordinary skill in the art to maximize both the kinetic rate and the thermodynamic conversion for the process of Hibi '640 by

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operating the fluidized bed at two different temperatures, i.e. at a higher temperature for kinetic reasons, and lower temperature for thermodynamic reasons, as suggested by Degnan '657.

Shirk '946 is applied as stated above to teach that a fluidized bed can have multiple compartments and the temperatures in these compartments can be independently controlled.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner can normally be reached on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/  
Primary Examiner, Art Unit 1793

nmn  
September 1, 2009